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5 **BEFORE THE STATE OF WASHINGTON**
6 **ENERGY FACILITY SITE EVALUATION COUNCIL**

7 In the Matter of Application No. 2009-01

EXHIBIT 31.00

8 WHISTLING RIDGE ENERGY LLC,

9 WHISTLING RIDGE ENERGY
10 PROJECT

11 **COUNSEL FOR THE ENVIRONMENT'S PREFILED DIRECT TESTIMONY**
12 **WITNESS: DON McIVOR**

13 Q. Please state your name and business address for the record.

14 A. Don McIvor, 129 Old Twisp Highway, Twisp, Washington, 98856.

15 Q. Where are you employed?

16 A. I am a consulting wildlife ecologist and a Natural Resources Coordinator for the Upper
17 Columbia Salmon Recovery Board.

18 Q. Please identify what has been marked as Exhibit 31.01.

19 A. Exhibit 31.01 is a copy of my resume which includes a description of my educational
20 background and professional employment experiences.

21 Q. Are you familiar with Whistling Ridge Energy LLC's application to construct a wind
22 energy facility in Skamania County, Washington?

23 A. Yes. I have reviewed numerous documents regarding the proposed project and its
24 environmental impacts.

25 Q. What documents did you review?

26 A. I reviewed the Amended Application for Site Certification (AASC) and attachments,
the Draft Environmental Impact Statement (DEIS) and attachments, a preliminary

1 response to the Counsel for the Environments Comments on the DEIS prepared by the
2 applicant and its consultants, the pre-filed testimony of Applicant's Witness Greg
3 Johnson (Exhibit 6.00) and associated exhibits (Exhibits 6.01 – 6.03), and the pre-filed
4 testimony of Applicant's Witness Jeff Reams (Exhibit 5.00) and associated exhibits
5 (Exhibits 5.01-5.06).

6 Q. Is the information contained within these documents relating to the proposed project's
7 impacts on wildlife and wildlife habitat within your area of expertise?

8 A. Yes.

9 Q. What else have you done in preparing your testimony?

10 A. I have spoken with Jim Michaels from the United States Fish and Wildlife Service
11 (USFWS) about Northern Spotted Owl issues, the USFWS national wind energy
12 guidelines, and the Migratory Bird Treaty Act. I have spoken to David Anderson at
13 Washington Department of Fish and Wildlife (WDFW) about cumulative impacts
14 analysis and raptor concerns. I have also spoken with Greg Johnson of WEST, Inc.,
15 and Curt Smitch, a consultant representing the Applicant, regarding cumulative
16 impacts, WEST's bird risk "exposure index," and bat mortality issues.

17 Q. Based upon your professional training and experience, and the interviews and
18 documents described above are you qualified to offer an opinion regarding the
19 proposed project and its environmental impacts on wildlife?

20 A. Yes.

21 HABITAT AND GEOGRAPHIC LOCATION

22 Q. Where is the proposed project located?

23 A. The proposed project is located on the north side of the Columbia River Gorge in
24 Skamania County. It covers approximately 1,152 acres. The project elevation varies
25 from approximately 2,100 to 2,300 feet above mean sea level. The Columbia River is
26 located approximately 2 miles to the south of the project.

1 Q. What type of habitat is the proposed project located in?

2 A. The site has been managed for commercial forestry for many decades—as much as a
3 century, according to the documents prepared for the Applicant. As such, while the
4 vegetation is largely native (with the exception of some weed species), the overall
5 species composition and age structure of the forest departs from what one would
6 encounter in natural habitat persisting under natural, rather than human-driven,
7 disturbance. There are coniferous and mixed deciduous-conifer forest stands on the
8 site, and a small amount of riparian hardwood forests. Grasses and shrubs are
9 extensively represented on the site as well. There are a few old growth trees, but they
10 are not numerous enough or in close enough proximity to each other to form stands.

11 The habitat is also fragmented by low-grade roads (primarily utilized to access
12 timber stands) and three linear features; two pre-existing power lines cross the site, as
13 does a gas pipeline.

14 Q. Are there geographic features within the project site that are significant to wildlife?

15 A. The site lies at the southern end of the Monte Cristo Range, and southwest of Mount
16 Adams. It is on the eastern flank of the Cascade Range. This is noteworthy because
17 raptors rely on north-south trending mountain ranges in the West to support their
18 annual migrations.

19 It is also worth noting that the Columbia River lies about two miles south of the
20 site. The Columbia River appears to be an important migratory corridor for birds, and
21 an important winter congregation area for wintering Bald Eagles.

22 Within the site, two bodies of water provide some habitat diversity as well as
23 sources of drinking water for bats, birds, and other wildlife, as well as source of insects
24 for food.

25 Q. Are you aware of any other wind power projects constructed in such a habitat?

26 A. No.

1 Q. Are you aware of any studies documenting the environmental impacts of constructing
2 and operating a wind project within this type of habitat?

3 A. No. This appears to be the first project of its kind, in terms of its placement in the
4 Western coniferous forest habitat type.

5 **BIRDS**

6 Q. During your review of the project, did you evaluate the protocols used by the
7 Applicant's consultants to evaluate the potential impacts the proposed project may have
8 on birds?

9 A. Yes.

10 Q. Are any of those protocols of concern to you?

11 A. Yes, I did have concerns regarding the wildlife consultant's exposure risk model.

12 Q. Please describe the exposure risk model.

13 A. The exposure risk model employed by the Applicant's wildlife consultant calculates an
14 "exposure index," an assessment of relative risk or exposure to moving rotor blades at
15 the project site. The index was calculated based on three variables: the mean relative
16 use of the site averaged across all surveys; the proportion of bird observations in which
17 the individuals were observed flying (recorded at the moment of detection); the
18 proportion of observations in which birds were detected in the rotor-swept zone, based
19 on their elevation when each bird was first detected.

20 Q. What are your concerns regarding this model?

21 A. Developing a biological model which incorporates the dynamic aspects of the natural
22 world, and incorporates a realistic representation of animal behavior as the animals
23 interact with that dynamic world, is a complex and difficult challenge. After
24 development, models require validation, which generally requires testing their
25 predictive power against real world situations. The fundamental problem with the
26 exposure risk model is that it appears to be untested, or at least the consultant has

1 provided no evidence that it has any usefulness for predicting outcomes in the real
2 world.

3 There are also some fundamental problems with the metrics used in the strike
4 risk model. The two variables recorded at the moment of bird detection (flying/non-
5 flying, in or out of strike zone) are probably a poor representation of animal behavior.
6 All birds at the site spend some portion of their lives in the air, and with rare exceptions
7 will at some point cross the rotor swept zone, exposing them to at least some risk.

8 This type of index or model handles rarity very poorly. This is because rare
9 species will be recorded less frequently in the field, and their behavior is therefore less
10 likely to be accurately represented by the model because little or no data for such
11 species is available to inform the model.

12 The avian reports in the DEIS' appendix do a reasonable job of expressing
13 caveats regarding the limitations of the index, and point out that its utility lies in
14 relative ranking within the site. However, information from the avian reports is
15 incorporated into the analyses in the DEIS and in some cases used to infer conclusions
16 that over-extend the limitations the index bears. For example, the Pileated Woodpecker
17 discussion in the DEIS concludes by saying none of the individuals detected were
18 within the rotor swept area, and by implication, suggests they are not at risk. But lack
19 of encounters in the rotor swept zone is simply an artifact of a small sample size, as I
20 have personally observed this species on a number of occasions flying at altitudes that
21 would place them within the strike zone defined by this project. I would point out that
22 the discussion of the exposure index and its conclusions are much more rationally
23 discussed in the AASC.

24 Another problem with this overly-simplistic model is that it does not account for
25 the size or flight speed of a bird. These are two characteristics that influence strike risk,
26

1 with larger and slower birds spending more time in the strike zone than smaller and
2 faster birds.

3 Additionally, whether one accepts the tenets of the index or not, the index
4 appears to be used inconsistently in the DEIS and AASC analyses. For example,
5 variables for calculating the exposure index for Olive-sided Flycatcher and Vaux's
6 Swift were not recorded for 2009 observations, and it's not clear why this opportunity
7 for additional data collection was missed. In neither the DEIS or the AASC were
8 Vaux's Swifts, Western Bluebirds, Olive-sided Flycatchers, or Pileated Woodpeckers
9 discussed in the context of the exposure risk index. All of those are either federal or
10 state species of concern, and do receive a more general discussion in the two
11 documents.

12 Q. During your review, did you have concerns regarding the location of the project and
13 migratory flyways?

14 A. Yes. The Columbia River, which is approximately two miles south of the proposed
15 project, is a well-known migratory flyway, which hosts large numbers of waterfowl and
16 shorebirds during the migration. The river could also play a role in songbird migration,
17 but our understanding of songbird migration is just too rudimentary to say with
18 certainty.

19 Q. Is there evidence in the record establishing that the project is located within a migratory
20 flyway?

21 A. The DEIS states that evidence collected at the site does not indicate the site to be within
22 a "major migratory pathway," though it is not clear what would constitute such a
23 feature. Based on my assessment of the site, I do not see any landscape features which
24 might tend to concentrate migrants in this area. The data collected for the avian and bat
25 reports and included in the appendices to the DEIS and AASC do not indicate major
26 migratory activity by birds or bats.

1 Q. Is there any evidence in the record regarding migratory activity by birds at night?

2 A. No. Songbirds in particular migrate at night, making them challenging to detect and
3 quantify. The record does not show that any effort was made to assess night migration
4 of songbirds through the area. In fact, the AASC mentions that night migration activity
5 at the site is unknown.

6 Q. What is the significance of nighttime migratory activity?

7 A. The (National) Wind Turbine Guidelines Advisory Committee Recommendations
8 suggest nocturnal migrant data collection in locations where geographic features might
9 concentrate migrants. While this site appears to lack such features, extenuating
10 circumstances could place songbirds at risk at this site. These include inclement
11 weather, which forces night migrants to fly at lower than normal elevations, or a coastal
12 storm system that could force migrating birds further in-land and concentrate them
13 where they might not normally occur. These types of events are difficult to sample
14 because they occur unpredictably and rarely, but it is important that a post-project
15 monitoring program should assess this risk, and competent site management actions
16 could mitigate such situations through pro-active curtailment.

17 Q. Have birds that are listed as endangered species under the Endangered Species Act
18 been documented at the project site?

19 A. The Northern Spotted Owl (NSO), a federally and state listed endangered species, has
20 been documented in close proximity to the site, though not on the site itself. The
21 northern-most portion of the project site overlaps an NSO circle (Moss Creek Circle),
22 and a second NSO circle (Mill Creek) is proximate to the project. After several years
23 of surveys for Northern Spotted Owls, the applicant's wildlife expert reported finding a
24 single male (supported by subsequent investigation) Northern Spotted Owl within the
25 Mill Creek Circle in Spring 2010. This discovery is disclosed in the DEIS, but the
26 AASC predates the detection.

1 Q. What are the implications of this discovery in light of the proposed project?

2 A. The 1.8-mile diameter NSO circles are intended to approximate the breeding range of a
3 pair of Northern Spotted Owls, with the intention that these areas will be managed to
4 conserve the owl's habitat into the future. About 2 acres of habitat in the Moss Creek
5 Circle would be impacted by the project as proposed, but in informal consultation with
6 the Bonneville Power Administration, the US Fish and Wildlife Service made a
7 determination that this loss of habitat would be insignificant to the spotted owl (based
8 on the conclusion that adequate habitat would remain even with the loss of the 2 acres).
9 The location and nature of the owl (as a single male) located in spring of 2010 led the
10 Service to concur that the project is not likely to adversely affect the Northern Spotted
11 Owl.

12 Q. Have any federal species of concern, or with special management status, been identified
13 at the site?

14 A. Both the Bald Eagle and the Golden Eagle occur at the site, and both are managed
15 under the Bald and Golden Eagle Protection Act as administered by the US Fish and
16 Wildlife Service. Because of the project site's proximity to the Columbia River, Bald
17 Eagles would reasonably be expected to wander through the site, probably infrequently
18 at current population levels, particularly during the winter. The Golden Eagle is a
19 raptor of more open country, but again, given proximity to its preferred habitat and the
20 fact that it could use the surrounding mountainous terrain for migration, it too should be
21 expected in at least low numbers at the site. The occasional presence of these species
22 would place individuals at some, albeit probably low, risk of collision with rotors.

23 The Northern Goshawk is a Washington state candidate species and a Federal
24 species of concern. WEST, Inc. did not detect the species during call surveys, but did
25 note individuals while conducting general bird surveys. The AASC is confusing on this
26 point, as the document states in one place that no goshawks were found on the project

1 site, and elsewhere mentions encounters with the species during the general avian
2 surveys. In spite of this inconsistency, the disclosure of potential impacts to the species
3 is handled adequately in the AASC.

4 The pattern of encounters at the site suggests an absence of breeding Northern
5 Goshawks, but a presence that could be explained by birds foraging from adjacent
6 habitats, or birds passing through in migration. The Northern Goshawk is a forest
7 raptor, and because of its habitat association we have little or no experience with this
8 species in proximity to wind turbines in western forests, making mortality risk hard to
9 predict. On the one hand, these birds are adept at flying in tight spaces and potentially
10 could navigate through rotors. On the other hand, moving rotors might be sufficiently
11 novel to Northern Goshawks that they won't be able to consistently avoid the moving
12 blades. Although the species appears to occur in low numbers at the site, if the project
13 were built it could provide an important opportunity to better understand how forest
14 raptors react and adapt to wind energy facilities.

15 The Olive-sided Flycatcher is another federal species of concern occurring at
16 the site. Like the Northern Goshawk, the Olive-sided Flycatcher is a forest-dependent
17 species, so again we have no experience with wind energy facilities located in its
18 habitat. It is worth noting that all 21 of the birds recorded at the site during the 2006
19 surveys were within the rotor-swept area (this metric was not recorded during the 2009
20 surveys). This suggests the species would be at some unquantified risk of collision
21 with moving rotors if the proposed project is built.

22 Q. Have any candidates for listing as species of concern in Washington State been
23 identified at the site?

24 A. The Pileated Woodpecker and Vaux's Swift are Washington state candidate species,
25 and they occur at the site. Of the two species, the Vaux's Swift could be most at risk,
26 given that they appear to migrate through the area each fall.

The Pileated Woodpecker, on the other hand, is another forest-dependent species, like the Northern Goshawk and the Olive-sided Flycatcher. Because no other wind turbine farms have been constructed in western forests, we lack any comparative data for evaluating how this species may or may not be at risk in the presence of a wind energy facility.

The Western Bluebird is a “state monitor” species, and it has also been recorded at the site and within the rotor swept zone. Individuals would therefore be at some risk of mortality from collisions with turbines.

BATS

Q. What is the significance of bats and how do they fit into the ecosystem?

A. Bats are a vitally important part of our ecosystems, providing an irreplaceable ecological service via the insects that they consume and in some regions of the country, the flowers they pollinate. That first ecological service is not only important to our personal comfort, as a lot of those insects are mosquitoes, but bats also reduce the abundance of insects that impact our agricultural crops.

Q. What types of challenges do bats face?

A. Like a lot of wildlife, bats are suffering from habitat loss and habitat degradation. More recently, a new fungal disease dubbed “White-nose Syndrome” has been devastating bats in the Northeastern US. While it is easy to dismiss this as a problem that is too geographically remote to be relevant to us, two things make the outbreak unsettling. First, the disease is spreading, and no one knows how far or how quickly it will spread. Second, the origin of the fungus is unknown, fatality can be 100 percent in local populations, and as of the moment there are no effective management tools. Bats are also at risk because they have a low reproductive rate, making it hard for populations to recover from mortality events.

1 With regards to wind energy facilities, bats seem to have some unique
2 characteristics. Most fatalities at wind sites are among migratory, tree-roosting species.
3 And in the last few years, barotrauma has been identified as a causal mechanism in
4 some bat deaths at wind facilities. This seems to occur when bats cross the low-
5 pressure vortex trailing behind the tips of moving rotors.

6 Q. Do you have concerns regarding information the Applicant has submitted regarding the
7 project's impact on bats?

8 A. Yes. With the exception of the hoary bat, the bats using the site have not been
9 identified by species. Accordingly, potential impacts on specific species of bats are
10 impossible to assess. Any stated affect on populations, which are unknown, is purely
11 conjectural.

12 Q. Are there other wind power projects that can supply this information?

13 A. No wind energy sites have been developed in Western coniferous forest habitat. Other
14 wind power projects in Washington are located in significantly different types of
15 habitat and data gathered from these sites cannot be used to extrapolate potential
16 impacts of the proposed project site. This is especially a concern in light of the
17 disproportionate impact wind energy facilities are believed to have on forest bats.

18 Q. The Applicant has submitted Anabat data for three years. Does the variation between
19 the results from one year to the next provide cause for concern?

20 A. Yes. In the first year data the Anabat equipment worked less than 25 percent of the time
21 and the breeding season for bats was missed. The value of that year's data is
22 questionable because of the equipment problems, and a conservative analysis should
23 not include that data because of its shortcomings.

24 Ignoring the first season's incomplete data, the Applicant collected two years of
25 data using Anabats mounted just above the ground. In their bat survey reports, the
26 Applicant provided comparable data from five wind energy sites. If you graph these

1 data, it is possible to illustrate the relationship between bat activity and mortality at
2 these sites, and at Whistling Ridge. This graph is presented as Exhibit 31.02. The data
3 suggest that estimated bat mortality at Whistling Ridge could be as low as 8
4 bats/turbine/year (2009 data) to 97 bats/turbine/year (2008 data). This latter figure is
5 more than twice the highest measured mortality rate from representative facilities.

6 In 2009, the Applicant's consultant also measured bat activity data at elevated
7 sites in the rotor-swept zone. This technique is believed to be a better indicator of bat
8 activity in the zone of risk. The fact that relatively little activity (4.6 passes/night) was
9 recorded is encouraging. However, because only a single year of elevated data for the
10 full season of bat use was collected, there is no way to determine if the 2009 data
11 accurately reflect annual variation in bat use at the site. The low-elevation data
12 collected in 2008 and 2009, for example, varied by a factor of almost 12.

13 Q. Do you have any concerns about the impact on the regional ecological community?

14 A. Yes, based on data collected to date it is impossible to say which number represents an
15 accurate portrayal of mortality at the site, or what the size or species composition of the
16 local bat community is. In Washington, bats, like raptors, occupy a predator role in
17 ecosystems, focusing on insects. Insects can be a vector for disease. Bats are a major
18 predator of mosquitoes. West Nile Virus is one example of a disease that is transmitted
19 by mosquitoes, and this disease poses a risk to both human and avian health. In already
20 depressed bird populations, a West Nile Virus outbreak can have a devastating
21 impact—this has been shown in sage grouse populations, for example.

22 Q. Were any bats with state or federal status identified at the site?

23 A. No. Two bat species, Keen's Myotis and Townsend's Big-eared Bats could occur at
24 the site. Those are both State Candidate species, and Townsend's Big-eared Bat is a
25 Federal Species of Concern. The Anabat studies conducted by the Applicant, however,
26 were unable to identify the bats detected at the site by species (with the exception of the

1 Hoary Bat). Consequently, the presence of these two species at the site can neither be
2 confirmed nor denied at this time.

3 Q. Do you have recommendations regarding mitigation measures for bats?

4 A. There seems to be great variation in the bat activity at the site from year to year. This
5 variation, in conjunction with the absence of information regarding the species
6 composition of this population, warrants an extended mortality study, should the
7 project be built. The lack of information regarding impacts of wind power projects in
8 western coniferous habitat also warrants additional research and study.

9 A recent study conducted in Pennsylvania by Ed Arnett and colleagues suggests
10 that altering cut-in speed of wind turbines can greatly reduce bat mortality.
11 Implementation of a similar mitigation measure may be warranted at Whistling Ridge,
12 if bat mortality is significant.

13 Q. Have any other species of federal or state concern been identified at the site.

14 A. Yes. Western Gray Squirrels have been documented on the site. The AASC makes a
15 statement to the contrary, saying no individuals of this species were detected. However,
16 the DEIS indicates that while no Western Gray Squirrels were detected during surveys
17 focused on that species, a few individuals were noted during other surveys.

18 CUMULATIVE IMPACTS

19 Q. Do you have concerns regarding the Applicant's evaluation of cumulative impacts in
20 the DEIS?

21 A. Yes. Cumulative impact analyses in Environmental Impact Statements often seem to
22 be written as an afterthought, and this one is no exception. While the discussion
23 touches on important issues, its treatment is often superficial. The analysis includes
24 extensive discussion of two cumulative impact studies, one for the Mid-Atlantic region
25 and one for the shrub-steppe dominated portion of the Columbia Plateau or Washington
26 and Oregon. In both cases, the habitat is not comparable to the setting for the Whistling

1 Ridge project, and the applicability of data from these projects to this project, which is
2 located in coniferous forest, is questionable.

3 Q. Are there other locations that should be considered in the cumulative impact analysis?

4 A. Describing “full build-out” of wind energy projects in the eastern Cascades is
5 challenging, principally because wind energy companies consider their development
6 plans as proprietary. Nonetheless, the cumulative impact analysis mentions the Middle
7 Mountain facility as the only project to which Whistling Ridge would contribute
8 cumulative impacts. I find it inconceivable that only two wind generating projects will
9 ever be proposed in the eastern coniferous forests of Oregon and Washington. In his
10 testimony, Greg Johnson states that there are “a handful of wind projects” that have
11 been proposed in coniferous forest landscapes in Washington. These additional sites
12 should be disclosed and discussed, and at least an educated guess at the number of
13 projects possible for the eastern Cascades—and their potential cumulative impact on
14 the resource--should be made.

15 Q. Are there other shortcomings in the cumulative impact analysis?

16 A. The Cumulative Impact analysis should include other foreseeable actions with which
17 this project could act synergistically. And “other foreseeable actions” should be
18 understood to include projects *in addition* to wind energy projects. The only mention
19 of future actions in the discussion of cumulative impacts states “[r]easonably
20 foreseeable future actions, including non-wind energy generation uses, are expected to
21 have a continuing negative impact on these species.” A cumulative impacts analysis is
22 designed to address the “death by a thousand cuts” issue. Will this project in
23 conjunction with past and current projects, surpass some tipping point causing
24 significant negative impacts? If not, is that tipping point foreseeable at some future
25 juncture, when this and other reasonably predictable projects are completed?
26

MITIGATION MEASURES

Q. Are there any mitigations measures not being suggested by the Applicant which you believe should be imposed?

A. Efforts should be made to ensure that the Applicant fully complies with all mitigation measures set forth in the latest editions of the USFWS and WDFW guidelines for wind power projects. Project specific mitigation measures include the following:

- Either the purchase and/or a monetary contribution toward the acquisition of a mitigation parcel to replace habitat permanently destroyed by the project.
- A representative of a regional non-profit organization with bird and/or bat expertise should be included on the Technical Advisory Committee (TAC).
- Extended mortality studies should be conducted for birds and bats to develop a better understanding of which species are in the area (in the case of bats), and which species are at risk. These studies should be conducted for a minimum of two years with the option of extending them if warranted. Results of such studies should be carefully monitored by a TAC, and operational procedures adjusted to minimize bat and bird mortality.
- Because this would be the first facility in a Western coniferous forest, the results of any such studies must be made available to the wider community, so lessons learned here can be applied on a wider scale.
- Appropriate BMPs and management strategies to avoid Bald and Golden Eagle strikes should be identified in consultation with the USFWS. Before project implementation and in consultation with the USFWS, the Applicant with the assistance of the TAC should identify and agree upon appropriate and prompt response protocol, (including shutting down problematic turbines) in the event a strike occurs.

- The Applicant should adopt low-impact lighting techniques for buildings and any other facilities constructed at the site. FAA lighting requirements for the wind towers themselves are reasonably consistent with migratory bird conservation, but maintenance buildings, etc. should be lit with low-wattage, shielded and down-cast lighting. The lighting can be adequate for safety at these sites without creating spilled light and interfering with the navigation of migrating birds. Lights that attract and concentrate night-flying insects could likewise attract bats to the area, increasing their strike risk, and, therefore, should not be used.
- Adaptive management strategies should be developed and applied by the Applicant and the TAC to minimize impacts on listed species or species of federal or state concern.